Audiovisual Narrative Creation and Creative Retrieval: How Searching for a Story Shapes the Story

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ABSTRACT

Media professionals – such as news editors, image researchers, and documentary filmmakers - increasingly rely on online access to digital content within audiovisual archives to create narratives. Retrieving audiovisual sources therefore requires an in-depth knowledge of how to find sources digitally. These storytelling practices intertwine search technologies with the user's ideas and production cultures. This paper presents qualitative research insights into how media professionals search in digital archives to create (trans)medial narratives, and uses the notion of creative retrieval to unravel the dynamics of audiovisual narrative production. Creative retrieval combines ideas about the effects of media convergence on media content, theories about serendipitous information retrieval, and studies of creativity to argue that retrieval practices of media professionals who create audiovisual narratives are governed by organizational, technological and content affordances and constraints. The paper furthermore exemplifies the first stage of an ongoing research project in which a user-centered design approach guides open source self-learning search algorithm development to support creative retrieval.

KEYWORDS

Audiovisual Narrative Creation; Transmedia Storytelling; Creative Retrieval; Serendipity; User Studies; Algorithm Development; User-Technology Interaction.

1 | INTRODUCTION

Media professionals – such as news editors, image researchers, and documentary filmmakers – increasingly rely on online access to digital content within audiovisual archives to create narratives (Huurnink, Hollink, & De Rijke, 2010). Searching and retrieving audiovisual sources within archives therefore requires an in-depth knowledge of how to find sources digitally. Although recent research shows that media professionals' (re)use of digitally archived material is increasing, there is comparatively little research on how this group searches for and locates audiovisual material (Huurnink et al., 2010).

To fill this knowledge gap, this paper presents qualitative research insights into how media professionals search for and use digital material to create audiovisual narratives. This topic fits into this special issue's overarching theme by investigating how narrative creation relates to technology use, and how search technologies specifically afford and steer creative narrative creation. The paper unravels the dynamics of audiovisual narrative production by reframing professional production cultures, search technologies, and user practices through the conceptual lens of creative retrieval. Creative retrieval combines insights about the effects of media convergence on media content (Erdal, 2009) with theories about serendipitous information retrieval (Foster & Ellis, 2014) and anthropological studies of creativity (Hallam & Ingold, 2007). Above all, creative retrieval delineates how these expert users employ digitized material and digital technologies to search and retrieve audiovisual sources to create new narratives.

The paper focuses on media professionals' information-seeking practices, and the integration of retrieved material into narratives. I draw particular attention to how, during creative retrieval, media professionals encounter useful yet unforeseen materials, and how these materials gain creative agency; in other words, how the practice of searching and encountering unexpected sources shapes narratives. The presented research outcomes are part of a larger research effort that closely maps media professionals' digital retrieval practices within a large audiovisual archive in The Netherlands - containing over 800 000 hours of audio-visual content - in order to develop new open source self-learning search algorithms that will support this user group's creative retrieval practices.

The paper's theoretical starting point is the recognition that understanding technology users is key to explain how media technologies gain shape and meaning (Oudshoorn & Pinch, 2003). This view also informs the larger research efforts' methodology: search-supporting algorithms are developed using a user-centered design approach. This means that users are included across the algorithms' development stages. An empirically grounded understanding of these users' search and narrative creation practices – for instance in terms of search query use, or experienced pressures of overarching production demands – will inform recommendations for algorithm development.

This paper discusses research insights from the first stage of the project. This stage consists of a co-design session with the project's user panel (including ten representatives from commercial and public broadcast organizations) and nine representatives from research and development partners, and from twenty interviews with media professionals from those organizations that are part of the user panel. The goal of developing search algorithms for implementation within one digital archive means that conclusions focus on the involved users' creative retrieval practices within this particular digital archive. However, as respondents were also asked about their general search practices, some level of generalization is possible.

The next section presents the theoretical framework for creative retrieval by linking the fields of media production studies, information retrieval, and recent work on the role of serendipity in creative practices.

After describing the research methodology, the subsequent analysis focuses on how the involved media professionals search for material, how they use retrieved materials to create audiovisual narratives, and what this implies about how the process of searching for a story shapes the story.

2 | THEORETICAL FRAMEWORK

2.1 THE SOCIOMATERIAL PRACTICES OF MEDIA PRODUCTION

The micro level analysis of media professionals' search and retrieval practices should be seen in the light of recent research interest in serendipitous search (Makri, Blandford, Woods, Sharples, & Maxwell, 2014; McCay-Peet & Toms, 2010), in relation to studies of media production that highlight the agency of media professionals who create audiovisual content. In line with Havens, Lotz, and Tinic (2009), the analysis aims to understand more quotidian practices of media production by studying industrial processes in conjunction with cultural processes. This parallels Caldwell's approach to study industrial practices such as "production narratives (and) institutional and procedural rituals as valuable sites of analysis for understanding how and why certain cultural forms are produced" (Havens et al., 2009, p. 245).

The present paper focuses on the search and retrieval practices of professionals in terms of interactions of human and material agency to analyze the process of audiovisual narrative production. More specifically, it traces the sociomaterial practices of media professionals as they create narratives. Orlikowski defines sociomateriality as "the constitutive entanglement of the social and the material in everyday organizational life" (Orlikowski, 2007, p. 1438). By seeing the social and material intertwined, it becomes possible to reconfigure agency as an emergent relational practice that becomes apparent in interaction. This supports an understanding of how audiovisual narratives are a product of socio-technical processes.

Orlikowski draws attention to how organizational practices alter as sociomaterial assemblages change. For example, she highlights how human-technology interactions such as Googling organize the everyday materiality of work practices (Orlikowski, 2007). This example is apt, especially when related to Media Studies' focus on media convergence.

Edal's analysis of news production and newsroom convergence, for example, concludes that the role technologies play and organizationally oriented sociological studies are stressed separately in literature on journalistic practices (2009). The sociomaterial approach integrates these two research areas to show how technologies are implicated in the organization of work. Furthermore, it helps to delineate how creative processes take shape. Draper argues that there is a lack of studies that connect the creative work that goes into media production with the resulting text's form and content (Draper, 2014, p. 1119). While activities of "creative laborers" are described in discrete contexts, they "rarely identify decision-making processes and other phenomena that might enable scholars to theory-build across industries and gauge how creative negotiations may influence textual output" (Draper, 2014, p. 1119). Draper calls for analytic concepts to identify parallels and divergences in creative practices, also to assess their textual consequences. A focus on emerging sociomaterial practices allows exactly this: a situated approach that focuses on both the human and technological actors involved in the creative process. However, whereas Draper sees an advantage in understanding the construction of "discerned savviness" as a form of tacit expert knowledge accrued by creative professionals, I instead want to draw attention to how, in sociomaterial practices, creativity takes shape in relation to socio-technical affordances and constraints. Where Draper moves to understand creative professionals' agency, characterized by their ability to make their own decisions, I instead approach agency as produced within sociomaterial interaction. This is more in line with approaches that focus on opening the "black box" of technology, such as Latour's understanding of technologies as power translating and inscribing actors that comprise actor networks (Latour, 1992), Flusser's work on technologies as apparatuses that conceal intentions and interests (Flusser, 2013, p. 24), or Manovich's research on how new media technologies manipulate meaning (Manovich, 2001, p. 49).

A focus on understanding user-technology interactions in order to develop algorithms is interesting in this respect. Algorithms, as "encoded procedures for transforming input data into a desired output, based on specified calculations" (Gillespie, 2014, p. 168) are often black boxed. They are simultaneously "invoked as powerful entities that

govern (…) the world", as well as perceived as "strangely elusive" technological artefacts that seem to mechanize relevance and discovery (Barocas, Hood & Ziewitz, 2013, p. 3). However, algorithms' success hinges on user adoption in use (Gillespie, 2014). The project aim to develop algorithms with users, adopts and puts into practice Gillespie's argument to study algorithms in terms of "a multidimensional 'entanglement' between algorithms put into practice and the social tactics of users who take them up" (Gillespie, 2014, p. 183). An analysis of sociomaterial practices draws this entanglement into focus, to better understand the tension between mechanized discovery and user-reported serendipitous search results. Because I focus human-technology interactions as the interface to explore emerging sociomaterial practices, I now turn to a short overview of how I understand media professionals' practices of information-seeking, especially in relation to ideas about creativity.

2.2 SERENDIPITOUS SEARCH BEHAVIOUR AND CREATIVE RETRIEVAL

How users search and retrieve information is a key topic within the academic field of Information Retrieval research. Professional search is defined as "interactive information retrieval performed by professionals in a specific domain" (Kim, Seo, & Croft, 2011, p. 827). Vassilakaki and colleagues identify two main strands of research into professional search: system-centered quantitative research, focused on log analysis, clicks, and search queries to identify user needs and build new systems; and, user-centered qualitative approaches concentrated on factors affecting search behavior, search processes and motivations (Vassilakaki, Garoufallou, Johnson & Hartley, 2014, p. 23).

System-centered research about media professionals' use of archival material concludes that these users have a strong demand for short excerpts of audiovisual material, and that search queries are often based on the titles of materials or names of specific people (Huurnink et al., 2010). Search behavior is furthermore divided into specific search *modi* such as browsing, topic selecting, querying and locating (Kouwenhoven, 2006), all of which occur within the industrial constraint of short deadlines. Recent research additionally shows that media professionals are primed to find material serendipitously within industrial constraints (Sauer & De Rijke, 2016). Serendipitous information retrieval is

characterized as a fortuitous accidental finding that is the outcome of a creative act (Toms, 2000), which is either afforded by the personality type of the seeker (e.g. "super encounterers" [Erdelez, 1999] would have "prepared minds" and are open to recognize serendipitous findings) or by triggers embedded in the search system. The literature focuses on how to manage serendipity by optimizing the serendipitous finding of relevant information (Makri et al., 2014; McCay-Peet & Toms, 2010). There seems, however, to be an inherent paradox built into this notion of serendipity management: how can users manage something accidental? For instance, Cunha's analysis of serendipity within organizational theory and management concludes that "unexpected sources of knowledge are by definition impossible to locate" while simultaneously claiming that "serendipitous discoveries may result from intentional exploratory search processes" (Cunha, 2005, p. 16). This suggests that serendipity is not so much an unexpected occurrence, but something that is the outcome of a (search) process.

Makri and Blandford (2012) recognize this shifting serendipity framework and suggest a process model to catch serendipitous search. Their focus on process treats behavior as a social, rather than cognitive, phenomenon since it aspires to understand "information seekers within their social context" (McKenzie, 2003, p. 20) as part of a discursive analysis of information use. While it is not their intention to prescribe how to design what they refer to as serendipity strategies (Makri et al., 2014), they conclude that digital information environments ideally be developed to support serendipity strategies to allow users to "make mental space or draw on previous experiences" (Makri et al., 2014, p. 2193).

Subjectivity is essential to an understanding of serendipitous information retrieval. While a system can potentially create opportunities for users to experience serendipity, a user needs to recognize something as a fortunate, accidental finding. This suggests moving away from building systems that "serve up" serendipity in favor of "empowering users to create their own personal 'recipes' for it", such as "varying your routine" (Makri et al., 2014, p. 2181).

To catch processes such as varying routines or playing with the affordances of digital archives to draw on serendipity, I relate serendipity to improvisation. In organizational theory, the concept of

improvisation describes how people navigate with(in) structures. This activity takes the shape of a constant orientation, a mixture of making do and letting go "in response to unexpected opportunities or challenges" (Orlikowski, 2000, p. 412). I refer to these processes of improvisational unfolding as creative retrieval: media professionals retrieve audiovisual sources to create new media texts through their tacit knowledge of – and active engagement with – digital technologies. The sociomaterial practice of creative retrieval blends the user's tacit knowledge with improvisational human-computer interaction to realize serendipitous findings.

3 | METHODOLOGY

The research project seeks to develop open source search algorithms to support media professionals' creative retrieval in an audiovisual archive. In the first stage of the project, twenty semi-structured interviews with media professionals form the starting point to grasp their creative retrieval practices. The interviewed professionals are image researchers, news documentalists, film archivists, fiction filmmakers, media innovation specialists and media education professionals. They produce media texts ranging from news broadcasts, political talk shows, entertainment quizzes, online documentary programs, media education programs and fictional films. The participants have different levels of work experience; some have been in the business for twenty years, while others have just started. This broad range of narratives and levels of experience provides a general overview of search and creation practices, and offers insights into possible expertise-related differences in search and production practices. Whereas the media professionals also describe their more general creative retrieval practices, their involvement centers on their use of one specific digital archive environment. This at once limits yet also focuses the research results.

The interview questions drew on insights gained during a focus group session organized at the start of the project. During this session, participants discussed their audiovisual search practices, needs, and wishes for the to-be developed search algorithms. In addition to this, participants created media professional profiles which were used to select interview respondents. Interviews lasted between 45 and 120 minutes, were transcribed and subsequently coded using a grounded theory approach.

The two forms of data collection, the focus group and interviews, fit the overarching methodology of the project's user-centered design approach. The ideas and experiences of media professionals form the basis of any to-be developed algorithm to support creative retrieval. The research project started with a number of assumptions, such as that media professionals will have specific needs when searching for reusable audiovisual material. The questions and answers posed during the focus group session are the starting point of what Qu and Dumay (2011, p. 238) call a "localist approach" that places equal value on an interview's content as its context. Interviews enable "making things out" in the context of their occurrence (Murphy, 1999, p. 208). The subsequent manual coding of the data identified recurring themes and patterns, thereby allowing a process of abstraction and generalization (Erdal, 2009, p. 221).

The qualitative research approach yields fine-grained insights in search and production processes. The study is however limited in scope, due to the relatively small group of respondents. The research limitations are informed by constraints such as the availability of respondents. However, in-depth interviews provide rich data on search and narrative creation practices, which grants insight into the role played by serendipitous search findings, and leads to recommendations for algorithm development.

4 | ANALYSIS

4.1 THE SOCIOMATERIALITY OF SEARCH PRACTICES

Overall, the media professionals start their search trajectories with initial domain exploration, using search technologies to browse for a topic, person, event, date, and the selection of initial materials, after which the process becomes one of refinement: sources are collected to ultimately share these with other team members, including directors and editors.

Media professionals describe a number of shared overarching constraints and affordances that govern their search practice, such as time and budget allotted to search, the media text's genre and intended audience, and their personal interest. Search and archive technologies are implicated in these constraints and affordances: the more optimized their knowledge of the functionality of search technologies, the faster relevant and cost-efficient sources are retrieved.

Despite these similarities in search constraints and affordances, the fact that the involved professionals create very different media narratives clearly influences their retrieval decisions. Format and form of the media text guide their search process: a 30 second video to be used in a news broadcast demands different content and search strategy than the creation of an online, interactive documentary. News documentalists who retrieve audiovisual material for news programs, for instance, describe their job as 'being mean and lean', implying that speed is a determining factor in their material selection process. Materials are sought to fit a media text format, such as, in this case, a news broadcast about current events. This means retrieving materials that fit the topic, and that are recently filmed. For example, as one news documentalist elaborates, finding 'filler footage' of city streets means carefully scrutinizing contextual factors: if people are wearing summer clothing, and the item is set in winter, then the footage is useless. The clip's time restrictions demand instant content recognition. Search terms will include the topic (street, city names) but also terms that help refine search results, such as – in this case- the season.

The immaterial format and content constraints therefore have material consequences in that, following Orlikowski (2007), these organize the creative practice. Media professionals alternatively describe format as an opportunity or a restriction. For instance, one documentary maker states that "you can do things online that you cannot do on television", in reference to the creation of an online counterpart to a television series about the Golden Age of the Netherlands. The affordances of digital interaction allow an alternative presentation of materials, in this case in the shape of an interactive "newspaper", browsable for more in-depth background stories about characters in the televised documentary. The online format gave the maker freedom to shape the material in a way that mirrored its content, by presenting the content as newspaper articles contemporary to the historical moments depicted in the television documentary, such as the invention of the printing press. This affordance - to present stories differently online - allowed the maker more time to explore alternative stories about historical figures. It also focused his search practice on finding material about historical events that could be turned into 'current events news articles'.

As the last example shows, format and medium shape the produced media text and influence search practices of media professionals. What also guides their search practices however, are the digital interfaces used to retrieve materials. Although some professionals describe how searching on social media to find virals or material that is not available in traditional archives is part of their search practice, many start their search within the large national audiovisual archive. They do so to find reusable material, to become inspired, or, less commonly, to gain a quick overview of a historical context. Professionals use the digital interface to search using personal names, broadcast date, broadcaster, program name, event, or the length of fragments. This faceted search, described as "the usual way to search" (news documentalist), comprises a daily work practice, and shapes the agency of these professionals; it is informed by how the archive affords retrieval, and users' tacit knowledge of these affordances. In a sense, this parallels Draper's (2014) conclusions that media producers use a learned tacit knowledge, a "discerned savviness", to find materials. However, where Draper relates knowledge to the implicit preferences of workers' superiors, I argue that this tacit knowledge can also be technologically informed. Knowing how to use search technologies allows these professionals to elicit serendipitous search results as part of their professional craft. In the case of the documentary maker working on the online newspaper about the Golden Age, this meant he used faceted search to find chronologically-sorted materials about important historical figures. During his search, he made a serendipitous find about a major figure in the founding of the Dutch East India Company which prompted further searches into the serendipitous find, ultimately supplying the content for the online newspaper articles. Furthermore, described search routines indicate that using search technologies not only organizes and constitutes a great deal of their work, but that these technologies also shape what sources are found and used; the archive's search interface affords faceted search, but does not allow for more exploratory, and perhaps associative, searching, and in this way determines retrieval practices. Any newly developed algorithms should embrace this practice; perhaps by offering options providing quick overviews of connected materials, or more exploratory search results to inspire new connections to a topic.

The latter is especially relevant when finding appropriate material is not straightforward. Respondents identify a lack of available metadata as an important challenge to successful retrieval, especially when material is to be used for its "symbolic" content. Symbolic meaning is not usually explicitly annotated. For instance, news documentalists describe the challenge of finding symbolic material such as a setting sun to report the passing of a person, metaphorical shots ("… of a wild water stream for increased financial flows in the economy") or generic "filler" videos to accompany a voice over, because these shots are not annotated for symbolic purposes, only in terms of their explicit content. Search practices then become geared at eliciting serendipitous findings, characterized by searching "around" a topic. When searching the larger audiovisual archive, this entails searching using synonyms, misspelled variation on the topic, or for programs that deal with a similar subject. This means playing with the organization, and searchability of the archive's search technologies, or by employing alternative strategies to find what they hope is contained within the archive. The resulting practice highlights how human and material agency intertwine: by relying on serendipity with a "prepared mind" and improvising with the affordances and constraints of used search technologies, such as the ways in which material can be sought using available metadata, and descriptions, these users retrieve material to create their media texts.

4.2 THE SOCIOMATERIALITY OF NARRATIVE CREATION

The professionals stress that processes of searching for audiovisual material and audiovisual narrative creation are not two clearly separated processes. Across the phases of narrative creation (exploring, refining, producing stories), different search processes are described (such as browsing, and selecting). Throughout these search processes, the foreseen narrative is prone to change.

Searching, as a practice in itself, thus triggers new and unforeseen searches and ideas for narratives. While most professionals report a skeleton structure for each of their narratives, consisting of an introduction, build-up, climax and resolution, they state that actual content is not pre-determined. The desk and image researchers maintain that, while they may use a "loose script", narratives change in response to found source material. Interactions with

search technologies not only organize daily work practices, but also the media texts that are the product of search practices. A startling example of this is provided by a researcher who, while searching for material about the Dutch royal family, came across a video of someone throwing pamphlets on the street where the royal family was to appear. Intrigued by this pamphlet, she subsequently researched this pamphlet, contacted the organization that printed these, and built the story around its role in anti-monarchy demonstrations. In this case, it was the researcher who caught something unexpected in the material, which triggered a new narrative. The serendipitous encounter is informed by this professional's recognition of something unforeseen yet fortuitous in the frame. Technological expertise allowed the researcher to pursue a whole new topic based on her search and retrieval mastery; multiple instances of creative retrieval produced a new media narrative. This implies that an important step in the next stage of the larger research project will be to examine to what extent the enrichment of descriptions and annotations of the audiovisual archives can inform algorithm development, and more importantly, how a detail such as a pamphlet can become more easily discoverable.

Related to ease of discovery is the importance of the ability to connect seemingly unrelated sources into narratives. For instance, creative retrieval practices prompted an image researcher to create his own archive of material encountered accidentally and not directly useful but of possible interest for future use, such as clips of a known, and usually quite publicly cynical, soccer trainer who was unexpectedly caught tearing up during an interview. He "accidentally encountered" this material – which was eventually used in a talk show - by combining search queries such as names, and topics mentioned in found news articles about a personal crisis in the life of this trainer. The serendipitous find was the result of combining technical expertise with domain knowledge; sharing it with a director led to a new angle in a final narrative. In this professional's search and retrieval practice, recognizing serendipitous material is the result of improvising with search technologies and information found about a topic or subject, and has become part of his craft of being a researcher, interested in material that is out of the ordinary.

Beyond discoverability and creative application of found materials, the overarching affordances and constraints of narrative creation also shape creative retrieval by setting the time to search, narrative length, perceived audience, genre, format and medium. As one researcher elaborates: "With every subject you have to think again about the way in which you want to tell the story. You need elements that are recognizable [to the audience] and surprising, these are a prerequisite. And you always need some form of drama, a kind of development". The perceived audience, genre and format specificities play a role in narrative creation (e.g. a quiz question always needs a 'punchline' [image researcher], a news item cannot be too visually gruesome [news documentalist]). Lastly, the medium-specificity of the narrative also governs ideas about the content. Different media are used to create alternatively shaped narratives to cater to different audiences: using Snapchat or Instagram to share a story with a younger audience, or presenting an interactive story online for audiences who want to explore stories by themselves, as one media innovation specialist explains. Medium-specificity seems less important to the final story than its format however, which seems to dictate its crossmedial identity. This, in turn, is also related to a perceived audience: as one professional explains, "something as simple as creating a YouTube channel means really getting in the head of your audience". This leads to a tension between wishing to surprise the audience and the fear of alienating viewers with content if it is too surprising. News documentalists argue that it is about creating a mix of known and new materials so that viewers can contextualize new information without becoming distracted: "if a viewer is surprised too much, he will no longer hear what is being said". Finding unforeseen material is therefore interesting, but whether or not material is subsequently used in the media text is governed by its deemed appropriateness for a specific audience.

In terms of sociomaterial practices, this implies that first of all, the produced narrative is the result of iterative processes in which retrieved audiovisual material and story mutually inform each other. The retrieved material, coupled with the afforded outline of "begin-middle-end" narrative provides a backbone for the creative (research) process. However, this process is open to serendipitous finds. As one researcher puts it: "it is still documentary, you cannot predict the final story". Second, the use of different media in crossmedial storytelling complicates this

picture. Online media are perceived to offer many yet-to-be explored affordances and constraints, such as the use of and distribution rights for televised material placed online. Finally, professionals also stress that, while the rough narrative may be created by (re)using audiovisual materials, the final text emerges only when the editor and director start working with the material. Therefore, integration of serendipitously found materials into overarching narratives is grounded in sociomaterial concerns about the appropriateness of retrieved materials for the final media narrative.

5 | CONCLUSION: CREATIVE RETRIEVAL AND SERENDIPITY

This paper argues that media professionals' search to find useful-yet-unforeseen audiovisual materials for media texts can be referred to as creative retrieval, a practice which integrates serendipity, creative processes, and media convergence. Furthermore, I argue that highlighting creative retrieval makes it possible to delineate and give agency to media professionals' reliance on improvising with technological affordances and constraints.

The analysis reveals that the involved media professionals have certain 'recipes' for creative retrieval. The respondents suggest that source materials, medium and format iteratively steer the development of the final audiovisual narrative, as do ideas about audience appropriateness. All involved professionals stress that search and retrieval is governed by specific industrial constraints and affordances, such as time to search and budget, coupled with creative constraints and affordances, such as genre, medium and audience appropriateness. Media professionals adapt their creative retrieval practices due to convergence - collaboration with other researchers, journalists, directors – and to align with said affordances. The decision-making process, as to which audiovisual materials are eventually included in narratives, is shaped by these industrial and cultural affordances.

What is the role of unforeseen, serendipitous, findings in this process? Media professionals describe that finding anticipated search materials is as important as discovering unexpected and unanticipated materials to perform their work. One professional, a curator, illustrates this by stating that at the start of searching for material, "you sort of know what you are looking for", but "you want to be surprised". Yet, at the same time, found sources cannot be "too surprising for the audience" lest these become too distracting. This suggests a tension between wanting to find surprising materials for the narrative, by for instance searching in alternative ways, misspelling or using synonyms as keywords, and creating surprising narratives for audiences. While narratives, as one researcher states, "depend on the material you find, [as] without material, there is no story", which ensures that "you cannot script every story completely", the insights shared imply that creating narratives is about managing a creative process; trying to elucidate wanted-yet-unknown sources is part of the creative retrieval process of media professionals.

The idea that serendipitous search results inform these professionals' creative retrieval practices, suggests that newly developed algorithms should embrace the importance of connecting material that is related by association (for instance by comparing descriptions and connecting shared keywords and entities in descriptions or meta data). A first step into this direction, is project-related work that seeks to generate descriptions of entity relations (Voskarides, Meij, & De Rijke, 2017) – thereby facilitating the exploration of relationships between for instance names, topics or events contained in annotations; to sort data in manners that match queries, also taking into account prior searches of the user, to work to adapt to users' tacit knowledge of material contained in the archive, and of the search technology itself.

In conclusion, I propose that serendipity is not one of the ingredients afforded or constrained in the dynamic relation between search, retrieval and narrative creation in this process. Rather, as part of creative retrieval, serendipity becomes a way to describe the overarching improvisational process of dealing with affordances and constraints. New algorithms may aid this process, taking into account the sociomateriality of creative retrieval. Media professionals experience agency when they use search technologies to manipulate the tension between mechanized discovery and serendipitous search. Searching for a story becomes creating a story.

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BIOGRAPHICAL INFORMATION

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